

PATENT



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Date: 2-25-03

Himanshu S. Amin

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#10/Appeal  
Brief  
3/11/03  
O.P.

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re patent application of:

Applicant(s): Peter Merchant

Serial No: 09/546,962

Filing Date: April 11, 2000

Title: PIEZOELECTRIC SCAN SYSTEM

Examiner: Seung H. Lee

Art Unit: 2876

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**Box AF**  
**Assistant Commissioner for Patents**  
**U.S. Patent and Trademark Office**  
**Washington, D.C. 20231**

**APPEAL BRIEF**

Dear Sir:

Applicant submits this brief in triplicate in connection with an appeal of the above-identified application. The Commissioner is authorized to charge \$320.00 to Deposit Account No. 50-1063 for the fee associated with this brief.

**I. Real Party in Interest (37 C.F.R. § 1.192(c)(1))**

The real party in interest in the present appeal is TELXON CORPORATION, the assignee of the present application.

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**II. Related Appeals and Interferences (37 C.F.R. § 1.192(c)(2))**

Appellant, appellant's legal representatives, and/or the assignee of the present application are unaware of any appeals or interferences which will directly affect, or be directly affected by or have a bearing on the Board's decision in the pending appeal.

**III. Status of Claims (37 C.F.R. § 1.192(c)(3))**

Claims 1-23 are pending in the application. The rejection of claims 1-23 is appealed.

**IV. Status of Amendments (37 C.F.R. § 1.192(c)(4))**

No claim amendments have been made subsequent to the final rejection of August 21, 2002.

**V. Summary of Invention (37 C.F.R. § 1.192(c)(5))**

The present invention relates to a low-cost, one-dimensional bar code scanner and reader which may be economically implemented on a PC card or hand-held scanner (p. 1, ll. 9-11). A piezoelectric scan system includes a light source directed at a radially-arc'd surface of piezoelectric material (p. 8, ll. 15-16). The piezoelectric material is mounted in the form of a radially defined arc at non-moveable fixed locations. Affixed to the piezoelectric material are electrodes which are connected to an AC power source. When the AC power source is applied to the piezoelectric material, the radially defined arc of the piezoelectric material is caused to expand and/or contract in a radially defined direction. (p. 8, ll. 21-25). As the material expands and contracts, the radially arc'd surface increases and decreases in a radial direction to and from the light source. The deflection angle for the approaching light changes causing light rays to appear at a target at different points. (p. 9, ll. 2-7).

As the target is scanned by the deflecting radially arc'd surface, light rays are directed through an aperture toward a photoelectric sensor. The photoelectric sensor converts the received light rays to an electrical signal which is provided to a conversion and interface system. The conversion and interface signal digitizes the electrical signal and transfers binary information representing bar code data via a system bus to a scanner processing system. (p. 9, ll. 12-20).

The piezoelectric scan system also includes a cylindrical beam expander, which is illustrated by reference numeral 400 in Fig. 8. The beam expander is preferably a polished round pillar located in a fixed location relative to the piezoelectric material, light source, and aperture window. An arcuate reflective outer surface of the beam expander provides for an expansion of a light ray from the light source, thereby further amplifying the scanning field size achievable with a piezoelectric material, which itself may have a fixed maximum displacement. The beam expander may alternatively have a spherical reflective outer surface in order to achieve a two-dimensional expansion of the light ray. (p. 14, ll. 12-20).

**VI. Statement of the Issues (37 C.F.R. § 1.192(c)(6))**

A. Whether claims 1-23 are patentable under 35 U.S.C. §102(e) as being anticipated by Brobst et al. (U.S. Patent No. 6,053,409).

**VII. Grouping of Claims (37 C.F.R. § 1.192(c)(7))**

For the purposes of this appeal only, the claims are grouped as follows:

Claims 1-23 stand or fall together.

**VIII. Argument (37 C.F.R. § 1.192(c)(8))**

**A. Rejection of Claims 1-23 Under 35 U.S.C. 102(e)**

Claims 1-23 stand rejected under 35 U.S.C. 102(e) as being anticipated by Brobst et al. (U.S. Patent No. 6,053,409). A reversal of the rejection is respectfully requested for at least the following reasons.

- i. Brobst et al. does not disclose each and every limitation as set forth in the claims of the present invention.*

***Applicable Law***

For a reference to anticipate 35 U.S.C. §102 requires that "each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *In re Robertson*, 169 F.3d 743, 745, 49 USPQ2d 1949, 1950 (Fed. Cir. 1999) (quoting *Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987)).

Brobst *et al.* does not disclose a beam expander, as recited in independent claims 1, 15, and 23. The Examiner relies on an oscillating mirror 129 of Brobst *et al.* as being equivalent to the beam expander of the subject claims. However, the oscillating mirror 129 of Brobst *et al.* is actuated by a motor for producing a scanning beam (col. 5, lines 1-4). The oscillating mirror 129 does not provide for an expansion of a light ray, in contrast to the beam expander of claims 1, 15, and 23.

In the Final Office Action dated August 21, 2002, it is stated that the beam expander reflects a light beam onto a target rather than expanding the light ray. The Examiner is relying on a portion of the claim which recites an additional function for the beam expander. In particular the Examiner is relying on the limitation, “said reflector reflecting a first portion of said light beam from said light source onto said beam expander, said beam expander reflecting at least a second portion of said first portion of said light beam onto said target...” as defining the function of the beam expander. However, the Federal Circuit has consistently held that “terms in a patent claim receive their plain, ordinary, and accepted meaning within the community of those of ordinary skill in the relevant art...[t]o discern accepted meaning, however, the construing court consults the specification and relevant prosecution history to provide context for understanding the meaning of the terms...” *Leggett & Platt, Inc. v. Hickory Springs Mfg. Co.*, 285 F.3d 1353, 62 USPQ2d 1266 (Fed. Cir. 2002). It is submitted that both the plain, ordinary, and accepted meaning of beam expander and the specification of the subject application support the construction of a beam expander as providing an expansion of a beam, or light ray. For example, see U.S. Patents 6,494,766 (“...beam expander (not illustrated) may be positioned in the path of the light beam to expand the light beam...”); 6,488,414 (“...a beam expander 34, which allows the light beam of photons guided by the core 36 of optical fiber 22, to expand and spread outward...”); 6,473,208 (“The beam expander 14 expands the beam diameters of the signal light...”); 6,470,752 (“The beam expander 7 expands a laser light beam...”); 6,404,957 (“...the beam expanders 210 expand the separated input lights...”). Accordingly, it is clear that one skilled in the art would have recognized that a beam expander is a device which is employed to expand a light ray. Moreover, the specification of the subject application supports this meaning on page 14:

The arcuate reflective outer surface 410 provides for an ***expansion of the light ray*** 100a from [light] source 100 thereby

further amplifying the scanning field size achievable with a piezoelectric material 110 which itself may have a fixed maximum displacement...the beam expander 400 may alternatively have a spherical reflective outer surface in order to achieve two-dimensional expansion of the light ray. (emphasis added).

Thus, although the beam expander may provide the additional function of reflecting a light beam onto a target, as recited in the claims, the beam expander also provides for an expansion of the light beam, as would have been recognized by one of ordinary skill in the art and as further supported by the specification. The oscillating mirror of Brobst *et al.* does not provide for an expansion of a light beam. Accordingly, Brobst *et al.* does not disclose a beam expander (*e.g.*, each and every element) as set forth in independent claims 1, 15, and 23.

Regarding claim 21, the Examiner contends that Brobst *et al.* clearly teaches the polygonal scan mirror and the oscillating mirror to reflect the light beam from the light source onto the target. However, it is submitted that Brobst *et al.* does not disclose ***whereby said light beam is expanded by the mirror*** as recited in the subject claim. Expanding a light beam is absent from Brobst *et al.* Thus, Brobst *et al.* does not describe each and every element as set forth in claim 21.

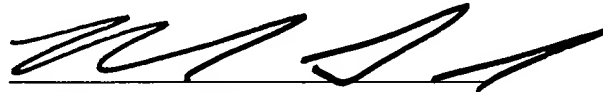
For the aforementioned reasons, Brobst *et al.* neither anticipates nor makes obvious the subject invention as recited in claims 1, 15, 21, and 23. Claims 2-14, 16-20, and 22 respectively depend from claims 1, 15, and 21. Accordingly, a reversal of this rejection is respectfully requested.

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**IX. Conclusion**

For at least the above reasons, the claims currently under consideration are believed to be patentable over the cited references. Accordingly, it is respectfully requested that the rejections of claims 1-23 be reversed.

Respectfully submitted,  
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**X. Appendix of Claims (37 C.F.R. § 1.192(c)(9))**

1. A system for scanning a target, comprising:  
a light source providing a light beam;  
a reflector having an arcuate reflective surface with a variable shape;  
a shape controlling system for controlling said shape of said reflector; and  
a beam expander;  
said reflector reflecting a first portion of said light beam from said light source onto said beam expander, said beam expander reflecting at least a second portion of said first portion of said light beam onto said target, and said shape controlling system selectively varying said shape of said reflector, whereby said second portion scans across at least a portion of said target.
2. The system of claim 1, further including a photo sensor, wherein said target reflects at least a portion of said second portion of light onto said photo sensor and said photo sensor generates an electrical signal representative of said at least a portion of said second portion of light.
3. The system of claim 1, wherein said reflector includes a piezoelectric material with an arcuate reflective surface.
4. The system of claim 1, wherein said shape of said reflector is generally radial.
5. The system of claim 1, wherein said shape controlling system provides a voltage signal to said piezoelectric material, and said shape of said reflector is varied according to said voltage signal.
6. The system of claim 5, wherein said shape of said reflector is generally radial.

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7. The system of claim 6, wherein said beam expander has a generally cylindrical reflective outer surface.

8. The system of claim 6, wherein said beam expander has a generally spherical reflective outer surface.

9. The system of claim 6, wherein said beam expander includes a convex arcuate reflective surface.

10. The system of claim 1, wherein said beam expander includes a convex arcuate reflective surface.

11. The system of claim 1, wherein said beam expander has a generally cylindrical reflective outer surface.

12. The system of claim 6, further including a photo sensor, wherein said target reflects at least a portion of said second portion of light onto said photo sensor and said photo sensor generates an electrical signal representative of said at least a portion of said second portion of light.

13. The system of claim 12, further including a conversion and interface system receiving said electrical signal from said photo sensor and converting said electrical signal to a digital code.

14. The system of claim 2, further including a conversion and interface system receiving said electrical signal from said photo sensor and converting said electrical signal to a digital code.



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15. A method of scanning a target, comprising the steps of:  
providing a reflector having an arcuate reflective surface with a variable shape;  
providing a beam expander;  
providing a light beam from a light source to said reflector;  
reflecting a first portion of said light beam off of said reflector and onto said beam expander;  
reflecting a second portion of said light beam off of said beam expander and onto said target; and  
varying said shape of said reflector , thereby scanning at least a portion of said target with said second portion of said light beam.
16. The method of claim 15, further including providing a control system with a control signal, wherein said shape of said reflector varies according to said control signal.
17. The method of claim 16, wherein said reflector includes a piezoelectric material having at least two electrodes, and said shape varies according to the voltage across said electrodes.
18. The method of claim 16, wherein said beam expander includes a convex arcuate reflective surface.
19. The method of claim 16, wherein said beam expander has a generally cylindrical reflective outer surface.
20. The method of claim 15, wherein said beam expander has a generally cylindrical reflective outer surface.
21. A target scanning apparatus, comprising:  
a housing having generally horizontal top and bottom sides, generally vertical left and right sides, said sides extending longitudinally between generally vertical front and rear ends;

a scanning system mounted in said housing and having a reflector with a variable shape arcuate convex reflective surface, a light source providing a light beam to said reflector, and a control system adapted to control said shape of said reflector;

a mirror displaced from said reflector in said housing near one of said front and rear ends; and

an aperture in one of said sides near said one of said front and rear ends;

said reflector reflecting a first portion of said light beam onto said mirror, and said mirror being oriented so as to reflect a second portion of said light beam from said reflector through said aperture and onto said target, and said control system varying the shape of said reflector whereby said second portion of said light beam scans at least a portion of said target.

22. The apparatus of claim 21, wherein said mirror has a convex arcuate reflective surface, whereby said light beam is expanded.

23. A system for scanning a target, comprising:

means for providing a light beam;

reflector means for reflecting a first portion of said light beam;

expander means for reflecting a second portion of said light beam from said reflector means onto said target; and

means for varying said shape of said reflector means, by which at least a portion of said target is scanned with said second portion of said light beam.